

CLAIMS

1. A backlight (5) for a 3D display device, the backlight (5) comprising a planar light guide (7) through which light is guided transversely
5 by internal reflection, wherein regions of the light guide (7) are configured to direct light propagating within the light guide (7), out of a face (7f) of the light guide (7) so as to form a plurality of line light sources.
2. A backlight according to claim 1, wherein said regions comprise
10 grooves (8).
3. A backlight according to claim 2, wherein the grooves (8) are filled with a material (9) having a higher refractive index than the light guide (7).
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4. A backlight according to claim 2 or 3, comprising cylindrical lenses disposed in the mouths of each groove (8).
5. A backlight according to claim 4, wherein the cylindrical lenses
20 are formed integrally with the material (9) which fills the grooves (8).
6. A backlight according to claim 3, 4 or 5, wherein the material (9) is Poly(naphthyl methacrylate).
- 25 7. A backlight according to claim 3, 4 or 5, wherein the material (9) is a composite material.
8. A backlight according to claim 3, wherein the material (9) is birefringent.
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9. A backlight according to claim 8, wherein the material (9) has a refractive index substantially equal to that of the light guide (7) in a polarisation

direction perpendicular to the grooves (8) and a refractive index greater than that of the light guide (7) in a polarisation direction parallel to the grooves (8).

10 10. A backlight according to claim 8 or 9, wherein the material (9) is
5 a stretched polymeric film.

11. A backlight according to claim 10, wherein the material (9) is Poly-Ethylene-Terephthalate (PET) or Poly-Ethylene-Naphthalate (PEN).

10 12. A backlight according to any one of claims 3 to 11, wherein the
material (9) which fills the grooves (8) is formed as a layer extending across
the upper surface of the light guide (7f), the thickness (d_2) of the layer being
small with respect to the period (p) of the grooves (8).

15 13. A backlight according to any one of claims 2 to 12, wherein the
grooves (8) have a V-shaped cross-section.

14. A backlight according to any preceding claim, wherein the light
guide (7) is made from Poly(methyl methacrylate).

20 15. A backlight according to any preceding claim, comprising a light
source (6) disposed adjacent to at least one side face (7s) of the light guide
(7).

25 16. A backlight according to claim 15, wherein the light source (6) is
an LED or a CCFL.

17. A 3D display device comprising a backlight (5) according to any
one of claims 2 to 16 and a display panel.

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18. A 3D display device according to claim 17, wherein the grooves (8) of the light guide (7) are skewed by an angle (θ) relative to the columns of the sub-pixels of the display panel.

5 19. A 3D display device according to claim 17 or 18, comprising light diffusing means (11) disposed between the backlight (5) and the display panel (10), wherein the light diffusing means (11) is switchable between a high scattering mode and a low scattering mode.

10 20. A backlight according to claim 1, wherein the light guide comprises a non-pattered substrate (13) and a micro-structured foil (14).